

Notes on *Panacea procilla lysimache* (Nymphalidae) from Costa Rica.

The nymphalid butterfly genus *Panacea* is generally thought to range from the highlands of Chiriqui Province of western Panama southward into South American. (DeVries, P.J. 1987. *The Butterflies of Costa Rica and their Natural History*. Princeton University Press, Princeton.) Godman & Salvin (1893) described a single specimen of the genus collected from "Chiriqui" as *P. lysimache* remarking that it was the only specimen known from Central America. In his treatment of *Panacea* Fruhstorfer (1912-1914. *Panacea*. in: A. Seitz (ed.). *The Macrolepidoptera of the World*. Vol. 5, Stuttgart (Alfred Kernan.) downgraded *lysimache* to a subspecies of *P. procilla*, a species that ranges from Panama to the Amazon Basin, and also noted that the holotype of *procilla* remained the only specimen of *Panacea* known from Central America. Until recently I was aware of only four Central American specimens of *P. procilla lysimache*, all from the highlands of Chiriqui in Panama (1200-2000m), and have suggested that the butterfly was likely to be found eventually in Costa Rica from localities in the Cordillera de Talamanca near Panama (DeVries 1987). Here I report the first authentic Costa Rican collection of *P. procilla lysimache* from a forest type very different where it has previously been collected.

On 3 August 1987 at 13:15 hours I collected a fresh male *P. procilla lysimache* (Godman & Salvin, 1893) [forewing length = 45.5mm; proboscis length 24mm] that was feeding at a sap flow on a medium-sized, mature *Persea americana* (Lauraceae) tree growing on the laboratory side of the bridge at Finca La Selva, Heredia Province, Costa Rica. The butterfly was perched head downward about 2m above the ground with the wings open and appressed to the tree trunk and feeding alongside an individual male *Myscelia cyaniris cyaniris* (Doubleday, 1848).

The *P. procilla lysimache* individual was originally noticed at 12:00 hours making sorties around, and perching head downward on the trunk of a introduced Asian tree (*Averrhoa carambola* : Oxalidaceae), and it may have been feeding on the rotting fruit that littered the ground under the tree. Both trees where the butterfly was observed grew in an open area heavily trafficked by humans located about 30m from the edge of a secondary forest and within 50 m of the Rio Sarapiquí.

While on the wing flutter-glide flight behavior and reddish underside made the *P. procilla* individual appear much like a large *Hamadryas amphinome mexicana* (Lucas, 1853). The following nymphalid species were noted to either be feeding on the fallen fruits of *Averrhoa*, the sap flow of the *P. americana* tree, or flying in the near vicinity at the time of capture: *M. cyaniris*, *Archaeoprepona camilla* (Godman & Salvin, 1884), *A. demophoon gulina* Fruhstorfer, 1904, *Prepona omphale octavia* Fruhstorfer, 1904, *Marpesia merops* (Boisduval, 1836), *Eueides lybia olympia* (Fabricius, 1793), *Cissia hermes* (Fabricius, 1775) and *C. labe* (Butler, 1870). Although I spent an additional 16 days at La Selva, no other *P. procilla* individuals were seen.

There are two considerations I wish to raise regarding *P. procilla* in Central America. One is that Finca La Selva (55-100m elevation) is covered mostly by lowland Atlantic rainforest that is very different from the cloudforests of

Chiriqui where previous Central American records of *P. procilla* originate. The fresh condition of the specimen suggests that rather than immigrating from the mountains of the Cordillera Central or Talamanca, it eclosed either at La Selva or in the immediate vicinity: a broad range of habitats for a rare butterfly species. The second point of consideration is simply to wonder how a large, garrishly colored butterfly species, that is collected commonly near human habitations in South America, has escaped detection in Costa Rica (and Panama) for so many years.

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An Additional Natural Hostplant of *Pieris Virginiensis* (W.H. Edwards) (Pieridae) in Ohio

For many years, the West Virginia white, *Pieris virginiensis* (W.H. Edwards), was known to utilize only toothwort, *Dentaria diphylla* Michx., as a natural hostplant (Klots, 1935). Although other species of *Dentaria* were long suspected to serve as natural hosts (Klots, 1951), only cut-leaved toothwort, *Dentaria laciniata*, was subsequently reported (Shapiro, 1974; Chew, 1980; Cappucino and Kareiva, 1985). Scott (1986) included Pennsylvania bitter cress, *Cardamine pennsylvanica* Muhl., and *Brassica* as hosts without reference. Recently, smooth rock cress, *Arabis laevigata* (Muhl.) Poir., was found to serve as an additional host in central Ohio (Shuey and Peacock, in press). *P. virginiensis* will also feed upon a number of mustards in the lab that are not utilized in nature (Shapiro, 1971; Chew, 1980).

On 25 April 1988, a female *P. virginiensis* was observed ovipositing on narrow-leaved toothwort, *Dentaria multifida* (Muhl.), on a rich forested stream terrace in Delaware County, Ohio. At this site, *D. laciniata* is abundant and serves as the primary host of *P. virginiensis*. *Arabis laevigata* is also fed upon with some frequency in this area but is uncommon in occurrence. *Dentaria diphylla* is absent. The single ovum deposited in *D. multifida* was collected and reared to pupation on the leaves of this newly discovered host. One additional ovum was later found on *D. multifida* and also reared to pupation.

Throughout its restricted range, *D. multifida* is generally considered uncommon, occurring in Indiana, Ohio, West Virginia, Kentucky, Tennessee, Georgia, Alabama, and North Carolina (Montgomery, 1955; Duncan and Foote, 1975). In Ohio, *D. multifida* is rare and considered threatened. Post-1960 records exist for Delaware, Athens, Washington, and Morgan Counties (McCance and Burns, 1985). The single historical Delaware County site is located several kilometers north of the site found in 1988 (Long, 1956; Allison W. Cusick, pers. comm.). Within Ohio, the known ranges of *D. multifida* and *P. virginiensis* overlap only in Delaware County.

Shapiro (1971) and Chew (1980) noted that *P. virginiensis* females will readily oviposit on many species of mustards but few mustards are typically available in the forested habitats of the butterfly. Hence, the utilization of *D. multifida* in